



Extraction Well Monitoring

Standard Operating Procedure

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Landfill Gas Management

Before leaving the office, complete *Per-Use Instrument Inspection Checklist* and make sure that you have everything you need to monitor a gas well:

1. Take site map showing gas well locations.
2. Take the appropriate data log sheet for the site.
3. Take your personal protective equipment (steel toe shoes, sun glasses, hat, sun screen lotion, water, etc.)
4. Take necessary tools to lift/ open well vault lid.

Upon Arrival:

1. Identify the extraction well and remove vault lid.
2. Note in the your daily log sheet any unusual conditions (such as broken lab cock, leaking valves & pipes, broken lids, flooded vaults, etc.)
3. Calibrate **GEM 500** to zero pressure using the following procedure:
 - a. Turn GEM 500 on by pressing the red button on the screen;
 - b. Press **Key 1** for General Utilities;
 - c. Press **Key 2** for Zero Pressure;
 - d. GEM screen will display the current static and differential pressure. If both pressures don't read 00.0, disconnect any tubes/ hoses from the GEM and press **Key 1** for zero pressures;
 - e. After pressures have been zeroed, GEM 500 screen will read "Zeroed OK," for three (3) seconds;
 - f. Press **Key 0** to exit.

***Note** – Calibrate instrument to zero pressure prior to reading EVERY extraction well.
4. Read the **Temperature** displayed on the Thermometer installed on the wellhead inside the vault.
5. Read the **Header Static Pressure** using the following procedure:
 - a. Turn on GEM 500 by pressing the red button on the keyboard;
 - b. When prompted, press **Key 0** to "Cont" (continue);
 - c. At the menu screen, press **Key 2** to "Read Gas Levels;"
 - d. When prompted, press **Key 2** to select "No" to "Read Using ID?"
 - e. At the menu screen press **Key 2** to "Cont" (continue);
 - f. Connect one end of the ¼" hose with the external filter/water trap assembly to the High Pressure port on the GEM 500. Attach the other end of the hose to the Quick Disconnect on the *header side of the wellhead*.

***Note** – the High Pressure Port is located on the top left corner on the side of the GEM 500.



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- g. Read the static pressure (SP) when the reading on the GEM 500 stabilized and note on data log sheet;
 - h. At the menu screen, press **Key 0** to “Exit;”
 - i. At the menu screen, press **Key 0** to “Continue;”
 - j. Remove ¼” flexible tubing from the Quick Disconnect on the landfill well head.
6. Read the **Well Static Pressure** using the following procedure:
 - a. Turn on GEM 500 by pressing the red button on the keyboard;
 - b. When prompted, press **Key 0** to “Cont” (continue);
 - c. At the menu screen, press **Key 2** to “Read Gas Levels;”
 - d. When prompted, press **Key 2** to select “No” to “Read Using ID?”
 - e. At the menu screen press **Key 2** to “Cont” (continue);
 - f. Connect one end of the ¼” tubing/hose with the external filter/water trap assembly to the High Pressure port on the GEM 500. Attach the other end of the hose to the Quick Disconnect on the *well side of the wellhead*.
***Note** – the High Pressure Port is located on the top left corner on the side of the GEM 500.
 - g. Read the static pressure (SP) when the reading on the GEM 500 stabilized and note on data log sheet;
 - h. At the menu screen, press **Key 0** to “Exit;”
 - i. At the menu screen, press **Key 0** to “Continue;”
 - j. Remove ¼” flexible tubing from the Quick Disconnect on the landfill well head.
7. Read the **Differential Pressure** using the following procedure:
 - a. Turn on GEM 500 by pressing the red button on the keyboard;
 - b. When prompted, press **Key 0** to “Cont” (continue);
 - c. At the menu screen, press **Key 2** to “Read Gas Levels;”
 - d. When prompted, press **Key 2** to select “No” to “Read Using ID?”
 - e. At the menu screen press **Key 2** to “Cont” (continue);
 - f. Connect one end of the ¼” tubing/hose with the external filter/water trap assembly to the High Pressure port on the GEM 500. Attach the other end of the same hose to the Quick Disconnect Pressure Port installed on the wellhead.
 - g. Connect one end of another ¼” tubing/hose to the Low (Impact) Pressure port on the GEM 500. Attach the other end of the same hose to the second Quick Disconnect Pressure Port installed on the wellhead
***Note** – the Low Pressure Port is located on the bottom left corner on the side of the GEM 500. For more details regarding the GEM 500 port location, refer to GEM 500 Operation Manual, page 6 - 7.
 - h. Read the differential pressure (ΔP) when the reading on the GEM 500 stabilized and note on data log sheet;
 - i. At the menu screen, press **Key 0** to “Exit;”
 - j. At the menu screen, press **Key 0** to “Continue;”



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- k. Disconnect the second ¼” flexible tubing from the GEM 500 and from the Pressure Quick Disconnect wellhead.
8. Read **Gas Levels** using the following procedure:
 - a. When prompted, press **Key 0** to “Cont” (continue);
 - b. At the menu screen, press **Key 2** to “Read Gas Levels;”
 - c. When prompted, press **Key 2** to select “No” to “Read Using ID?”
 - d. Attach one end of a flexible ¼” tubing/hose with the external filter/water trap assembly to the High Pressure port on the GEM 500. Attach the other end of the same hose to the Quick Disconnect Port installed on the wellhead;
 - e. When ready, press **Key 5** to start the pump on the GEM 500. The seconds counter (clock) on the GEM 500 will start at the same time as the pump;
 - f. When the gas level reading stabilizes on the GEM 500 screen, record gas levels on the data log sheet.

Benefit of Compliance to Instruction:

- Evaluate the efficiency of the landfill gas extraction system and using the collected data to make well adjustments to optimize the system’s operation
- Comply with Regulatory Agency(s) guidelines
- Provide accurate, complete and consistent data

Consequence of Non-Compliance to Instruction:

- Inaccurate and inconsistent readings
- Useless data that must be sampled again
- Inaccurate adjustments
- Possibility of underground fires

Environmental Management System (EMS) –ISO 14001

PROCESS MAP #: GM-1.0

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